PURCHASE DESCRIPTION
TEST REQUIREMENTS FOR BUNK AND LOFT BEDS

The contractor is responsible for conducting all applicable performance test requirements as specified herein. The contractor may use his own or any other facilities suitable for the performance of the tests. The Government reserves the right to witness any tests where such inspections are deemed necessary to assure that the beds meet all test requirements.

General Test Requirements.

1. The applicable tests below shall be performed on bunk, loft and bunk/loft bed models designed and marketed for adult dormitory/institutional use. If bed is designed such that more than one useable configuration is possible (e.g., bed can be bunked or set up as a loft), all applicable tests must be performed on each "worst case" configuration, as mutually agreed to between the GSA/NFC Engineering Division and the offeror. One factor in determining "worst case" is that the bed spring/platform be placed in its uppermost position. The top sleeping surface of both bunkable and loft units shall then be tested in accordance with Group 1 test requirements below.
2. Tests may be performed in any sequence, however, all tests in Group 1 shall be performed on only one bed unit of each type being tested. Additional beds may be used for the Group 2, 3 and 4 tests.
3. All tests shall be performed without a mattress, unless otherwise specified.
4. Complete, passing test results, recorded on the Bunk and Loft Bed Test Report Form included within this document, shall be submitted with the offer in order for the bed to be considered for award. Test reports shall be signed and dated by both the person performing the tests and the person who is submitting the offer.
5. **One clear, original photograph** of each test being performed on the applicable bed shall also be submitted with the test reports. Photos shall be of the actual unit being tested, not a mockup of the tested unit.
6. Test reports shall be not more than three (3) years old at the time an offer is submitted. All performance test reports must be updated when they are five (5) years old, or sooner if any modifications are made to the bed design, construction or materials during the five-year period. It is the supplier's responsibility to track the age of test reports. When the five year age limit is approaching, the supplier shall retest his products and provide the new test reports to the contracting officer for approval, so that by the five year mark, updated test reports will be in place.

Tests.

Group 1 - Tests required for all bunk and loft bed designs. For each of the tests A, B, C and D below, bunkable beds shall be bunked, with the top sleeping surface placed in its uppermost position, and the top bunk shall be tested. Loft beds shall be set up with the top sleeping surface in its uppermost position, and the top sleeping surface shall be tested.

A. Roller deflection test. A 455 mm diameter by 610 mm long cylinder, filled with water to a total mass of 100 kg, shall be placed across the springs/platform, and rolled along the length of the bed spring/platform (see figure 1). The cylinder shall be centered across the width of the bed. The bed spring/platform shall be in place as used in the bed, between the head and the foot board. In the event that the head and footboard prohibit testing because of lack of room on the testing equipment, the upper portion of the head and footboard may be removed.

The rolling motion shall start from one end of the bed and roll to the other end for 25,000 cycles. One cycle is completed by rolling the cylinder from one end of the spring/platform to the other and then rolling it back to the starting point. Upon removal of the test cylinder, the crown in the arc of the spring strands shall have changed not more than ±13 mm. The connecting links may be replaced as necessary during the test. Failure of the test shall be cause for rejection. When a bed platform is tested, any failure, loosening of joints or distortion after testing that would affect safety or serviceability shall be cause for rejection.

B. Static force test. The test mass shall be 272 kg, 455 mm wide x 1065 mm long. The test mass shall be placed midway between the bed ends (figure 3) so that the 1065 mm dimension is positioned across the bed side rails/structure. At the center, the deflection of the side rails/structure shall not be more than 14.5 mm with test mass in place. After removal of the test mass, the side rails/structure shall have set not more than 1.5 mm and shall show no visible distortion. Failure of the test shall be cause for rejection.

C. End impact force test.

Preparation: Place bed assembly on a smooth wood or concrete floor. Remove any adjustable glides. Block the bed assembly at the head and foot with 38 mm H x min.1100 mm L x min. 3 mm thick steel angle securely attached to the floor. Securely attach 600 mm W x 280 mm H x 19 mm thick pieces of plywood shielding to the head and foot of the bed so that bottom edge of the shield is even with the bottom edge of the bed side rail/structure below the mattress. Shield height may be increased to span to the next higher rail. In no case shall the shields be positioned so that they add support or rigidity to the bed assembly (such as by covering the joints between the top and bottom bunk units or the joints between the posts and the cross rails). Cover plywood shields with 600 mm W x 280 mm H x 1.9 - 2.5 mm thick sheet steel.

Preparation of test apparatus. Suspend two round, 45.5 kg each, steel masses with chains, 2620 mm above the point of impact. Position one mass and chain at each end of the bed. At rest, with the chains perpendicular to the floor, one mass shall touch the shield at the head and one mass shall touch the shield at the foot of the bed. These masses shall be located at the center (side to side) of the shield, 140 mm above the bottom edge of the shield.

Test procedure. Pull one mass out a distance of 1100 mm from its rest position and release so that the mass swings freely and impacts the shield on the end of the bed assembly. Repeat this procedure for the mass at the other end of the bed. Repeat this procedure so that alternate impacts are made on the bed assembly. Each mass shall strike the bed 25 times, 50 impacts total.

Acceptance criteria. Carefully inspect the entire bed assembly for damage. Bed components and parts shall not be loose, bent or damaged in any way. Headboard shall remain securely attached. Bunk beds shall remain securely joined together. Drawers (when present) shall continue to operate smoothly and quietly. Any distortion, cracked weld joints, loose fasteners/connectors, loose wood joints etc. will be cause for rejection.

D. Top impact test. **Unit shall be tested with a 160 mm maximum thickness mattress in place**. **Mattress used shall be of standard innerspring or foam construction and shall not have features that add support or rigidity to the bed assembly.** Securely wrap a bundle of 875 mm (± 2 mm) long steel rods together (or equivalent solid mass of the same dimensions) to make up a 100 kg mass. Suspend this mass 1220 mm above the bed unit. Position the long axis of the mass parallel to both the long dimension and the horizontal surface of the bed. Center the mass over the upper bed unit. Release the mass and allow it to free-fall onto the bed unit. Repeat this procedure for a total of four impacts.

Acceptance criteria. Carefully inspect the entire bed assembly for damage. Bed components and parts shall not be loose, bent or damaged in any way. Headboard shall remain securely attached. Bunk beds shall remain securely joined together. Drawers (when present) shall continue to operate smoothly and quietly. Any distortion, cracked weld joints, loose fasteners/connectors, loose wood joints etc. will be cause for rejection.

Group 2 - Additional tests required for beds with spring unit.

A. Bed spring rapid pressure impact test. The bed springs shall be mounted and secured to an accelerated pressure deflection machine. The machine shall operate at approximately 2,200 strokes per hour. The stroke of the shaft is adjusted to exert a downward deflection of 51 mm measured from the top of the spring strand (figure 2). The load head shall be centered across the width of the bed. After 100,000 deflections (strokes) the set shall not exceed ± 6.5 mm in the spring. The connecting links may be replaced as necessary during the test. Failure of the test shall be cause for rejection.

B. Spring unit racking test. A spring unit shall be placed horizontally and restrained along the length of one side rail. Reference lines shall be established to determine if any permanent distortion has taken place during the test. A 91 kg. mass shall be applied to the end of the other side rail in the direction of the side rail. Permanent distortion of 3 mm or more shall be cause for rejection.

Group 3 - Additional test required for beds with a wood headboard.

Joint test. Suspend headboard (by itself) from one top corner so the opposite bottom corner is 300 mm above a concrete floor. Release headboard and allow it to free-fall to the floor. Repeat this test, suspending the headboard from the other top corner. After testing, carefully inspect the headboard. Any broken, loose or open joints shall be cause for rejection.

Group 4 - Additional tests required for beds with built-in drawers such as captain's beds, underbed drawer units and drawers designed to be attached underneath the bed.

A. Drawer cycle test. Secure a 22.5 kg. mass to the inside of a drawer. Perform the cycle test by opening and closing the drawer 25,000 cycles. After testing, manually repeat the opening and closing cycle while inspecting for any impaired operation, misalignment, binding or damage of components. Failure of the drawer to operate smoothly and quietly without increased effort, and the positive drawer outstop to function properly by retaining the drawer, shall be cause for rejection.

B. Static force drawer test. Pull the drawer out of the unit 125 mm. Slowly apply a 91 kg mass to the middle of the drawer front. Counter balance the drawer unit if necessary to keep unit from tipping over. Maintain this force for 5 minutes. Remove the mass. Failure to operate smoothly, quietly and without binding after the mass is removed shall be cause for rejection.

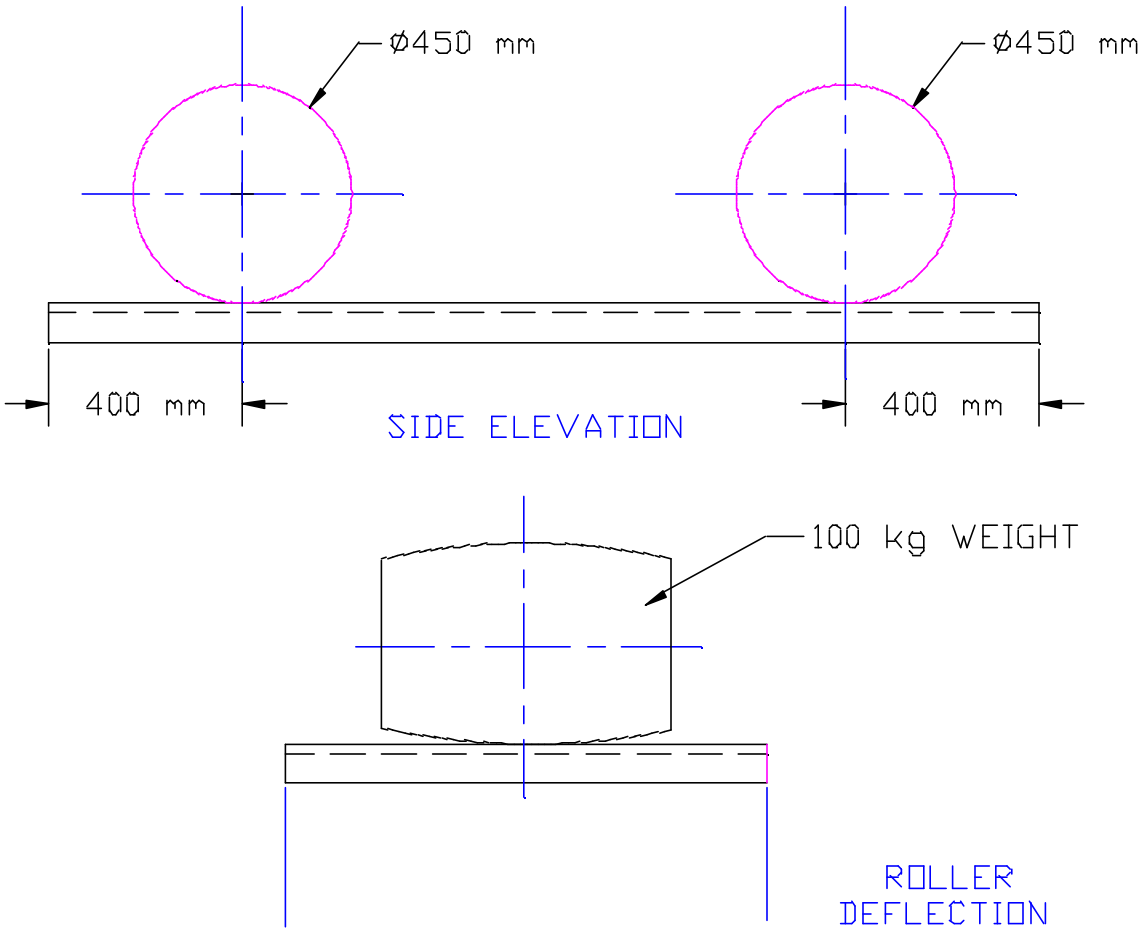
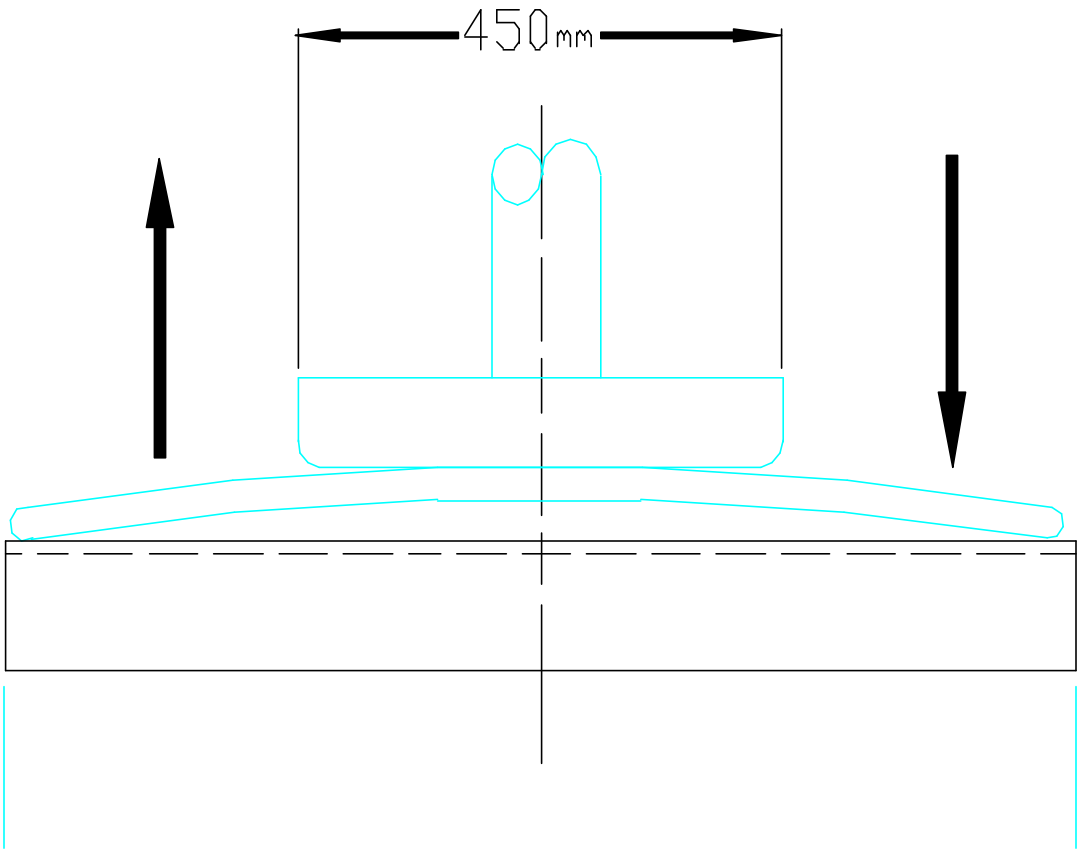
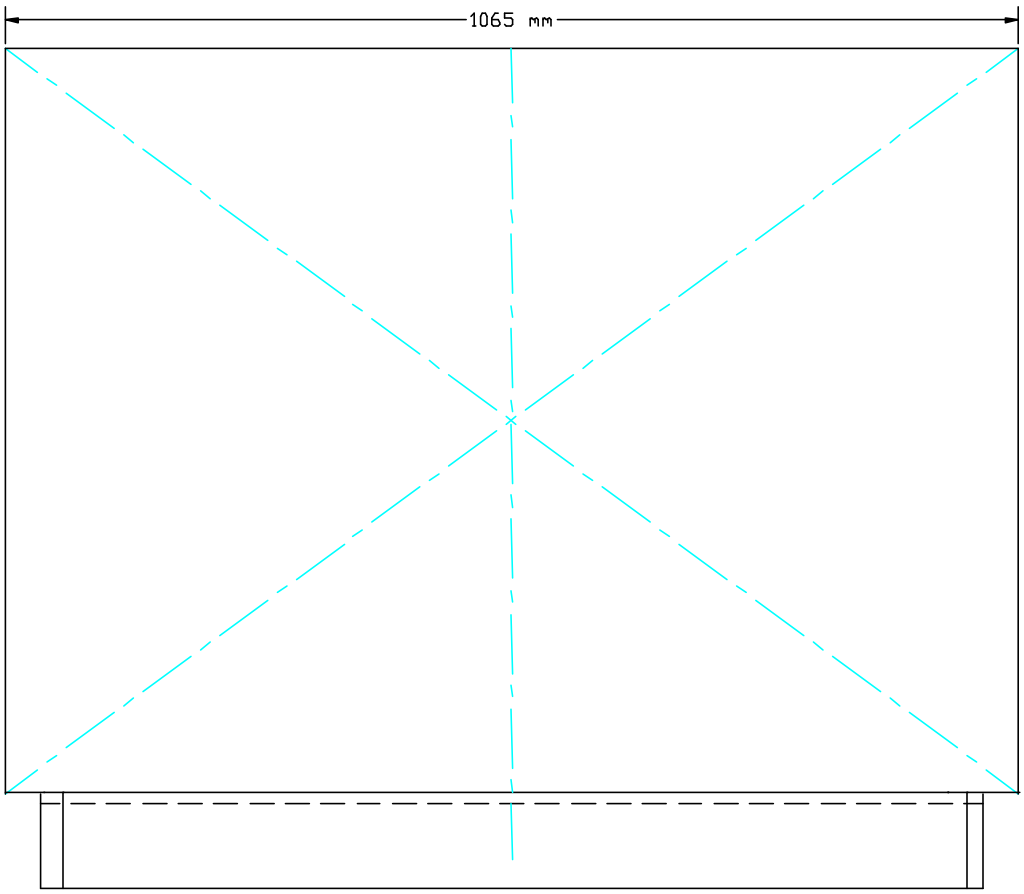

Ø450 mm
Ø450 mm
400 mm
400 mm
SIDE ELEVATION
100 kg WEIGHT
ROLLER
DEFLECTION
END VIEW

FIGURE 1



RAPID PRESSURE IMPACT DEFLECTION
SIDE VIEW

FIGURE 2



STATIC LOAD

SIDE ELEVATION

FIGURE 3

BUNK AND LOFT BED TEST REPORT FORM

Test report # : _____ Date tests completed _____

Name of bed manufacturer: _____

Style/model number of bed tested: _____

Name of furniture line to which this bed belongs: _____

Type of bed: _____ (platform or spring type)

Built-in Drawers: _____ (yes / no)

Group 1 Test Results	**PASS**	**FAIL (explain reason for failure)**
A. Roller deflection test		
B. Static force test		
C. End impact force test		
D. Top impact test		

Group 2 Test Results	**PASS**	**FAIL(explain reason for failure)**
A. Bed spring rapid pressure impact test		
B. Spring unit racking test		

Group 3 Test Results	**PASS**	**FAIL(explain reason for failure)**
Joint test		

Group 4 Test Results	**PASS**	**FAIL(explain reason for failure)**
A. Drawer cycle test		
B. Static force test		

(form continued on next page)

Name of person who performed the tests (printed) _____

Signature_____

Name and address of test facility _____

_____

Phone number (for questions)_____

Name of person who is submitting offer (printed) _____

Signature_____ Date_____

Company name _____

Phone number (for questions)_____